

Expanded Form, and Scientific Notation

Why even learn this? It is a way to take huge numbers and express them as smaller numbers. It also makes it easier to compare large numbers.

EXPANDED FORM

Example:

$$31\,964\,434 = 30\,000\,000 + 1\,000\,000 + 900\,000 + 60\,000 + 4\,000 + 400 + 30 + 4$$

Using Powers of 10 in the expanded form

First write each number as a product of a whole number and a multiple of ten

$$3 \times 10^7 + 1 \times 10^6 + 9 \times 10^5 + 6 \times 10^4 + 4 \times 10^3 + 4 \times 10^2 + 3 \times 10 + 4$$

Then as a power of ten

A number written in scientific notation is a product of two numbers, one is a power of ten, and one is a number between 1 and 10. (how far over are you moving the decimal?)

$$4.1 = 4.1 \times 10$$

$$410 = 4.10 \times 10^2$$

$$\begin{array}{r} \text{---} \cdot \text{---} \\ 4105 \end{array} = 4.105 \times 10^3$$

$$\begin{array}{r} | \\ 41\ 057 \end{array} = 4.1057 \times 10^4$$

$$410\ 578 = 4.10578 \times 10^5$$